

Name: _____ Per _____ Date _____

Unit 5 Integrals Review #1

1. $\int \frac{4}{\sqrt{t}} dt$

2. $\int (u^3 - 2u + 7) du$

3. $\int \frac{1-2x^3}{x^3} dx$

4. $\int (x-8)^{23} dx$

5. $\int \frac{x}{(4x^2+1)^3} dx$

6. $\int \frac{y}{\sqrt{y+1}} dy$

7. $\int_{-1}^1 x^4 dx$

8. $\int_{-3}^0 (x^2 - 4x + 7) dx$

9. $\int_0^2 2x(x^2+1)^3 dx$

10. $\int_{-1}^1 \frac{x^2}{\sqrt{x^3+9}} dx$

11. $\int_2^1 (4-3x)^8 dx$

12. $\int_{-1}^2 |x| dx$

13. Evaluate $\int_0^6 f(x) dx$, if $f(x) = \begin{cases} x^2, & x \leq 2 \\ 3x-2, & x \geq 2 \end{cases}$

14. Find $\int_0^6 3x dx$ using Riemann Sums with $n = 2$ from the right.

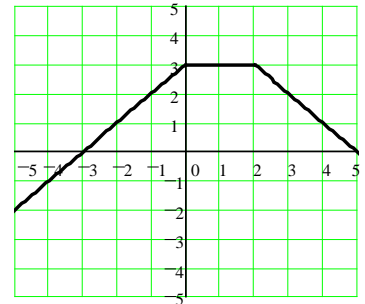
15. Find $\int_1^9 x^2 dx$ using Riemann Sums with $n = 4$ from the left.

16. Find the total area that is between the curve $y = 4 - x^2$ and the interval $[-4,0]$. Make a sketch of the region.

17. Solve the following initial value problem: $\frac{dy}{dx} = 9x^2 - 4x + 5$, $y(-1) = 0$.

18. If $\int_1^7 f(x)dx = 12$ and $\int_7^3 f(x)dx = 10$ find $\int_1^3 f(x)dx$

19. If $f(x)$ is the graph to the right, find $\int_{-5}^5 f(x)dx$



20. $\int \frac{6}{\sqrt[3]{t}} dt$

21. $\int (u^{-3} - 2u^{-2} + 5) du$

22. $\int \frac{4x - 8x^4}{4x^4} dx$

23. $\int (x-2)^{-15} dx$

24. $\int \frac{6x}{(3x^2+1)^5} dx$

25. $\int \frac{y}{\sqrt{y^2+1}} dy$

$$26. \int_0^2 x^2 dx$$

$$27. \int_{-2}^2 (x^2 - 5x + 4) dx$$

$$28. \int_0^1 3x^2(x^3 + 1)^3 dx$$

$$29. \int_1^{\frac{1}{2}} \frac{x^2}{\sqrt{x^3 + 7}} dx$$

$$30. \int_2^0 (3x - 1)^2 dx$$

$$31. \int_{-3}^1 |x + 2| dx$$

$$32. \text{ Evaluate } \int_{-5}^4 f(x) dx, \text{ if } f(x) = \begin{cases} -4 & , x \leq -3 \\ 2 & , -3 < x < 0 \\ 1 & , x \geq 0 \end{cases}$$

$$33. \text{ Find } \int_0^4 (2x + 1) dx \text{ using Riemann Sums with } n = 2 \text{ from the right.}$$

$$34. \text{ Find } \int_0^8 (2x^2 - 1) dx \text{ using Riemann Sums with } n = 4 \text{ from the left.}$$

35. Find the total area that is between the curve $y = \cos x$ and the x-axis on

$[-\frac{\pi}{2}, \frac{\pi}{2}]$. Make a sketch of the region.

36. Solve the following initial value problem: $\frac{dy}{dx} = 6x^2 + 4x - 2$, $y(-1) = 0$.

37. $\int_1^5 f(x)dx = -1$, $\int_3^5 f(x)dx = 3$ and $\int_3^5 g(x)dx = 4$

Find: A) $\int_3^5 [2f(x) + g(x)]dx$ B) $\int_5^1 f(x)dx$ C) $\int_1^3 f(x)dx$

Integrals Review #1 Solutions

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|--|--|----------------------------------|
| 1. $8t^{1/2} + C$ | 12. $\frac{5}{2}$ | 24. $-\frac{1}{4(3x^2+1)^4} + C$ |
| 2. $\frac{u^4}{4} - u^2 + 7u + C$ | 13. $\frac{128}{3}$ | 25. $\sqrt{y^2+1} + C$ |
| 3. $-\frac{1}{2x^2} - 2x + C$ | 14. 81 | 26. $\frac{8}{3}$ |
| 4. $\frac{(x-8)^{24}}{24} + C$ | 15. 168 | 27. $\frac{64}{3}$ |
| 5. $-\frac{1}{16(4x^2+1)^2} + C$ | 16. $\frac{48}{3}$ | 28. $\frac{15}{4}$ |
| 6. $\frac{2}{3}(y+1)^{3/2} - 2(y+1)^{1/2} + C$ | 17. $y = 3x^3 - 2x^2 + 5x + 10$ | 29. 0 |
| 7. $\frac{2}{5}$ | 18. 22 | 30. -14 |
| 8. 48 | 19. 13 | 31. 5 |
| 9. 156 | 20. $9t^{2/3} + C$ | 32. 2 |
| 10. $\frac{2\sqrt{10} - 4\sqrt{2}}{3}$ | 21. $-\frac{1}{2u^2} + \frac{2}{u} + 5u + C$ | 33. 28 |
| 11. -19 | 22. $-\frac{1}{2x^2} - 2x + C$ | 34. 216 |
| | 23. $-\frac{1}{14(x-2)^{14}} + C$ | 35. 2 |
| | | 36. $y = 2x^3 + 2x^2 - 2x - 2$ |
| | | 37. a) 10 b) 1 c) -4 |